Bachelor / Master Thesis

Optimal Design of Photovoltaic Systems

Course of study: Mathematics, Computer Science, Computational Engineering
Kind of thesis: Programming, Simulation, and Optimization
Programming language: Python
Start: 2022

Topic

In this project we are looking at photovoltaic roofs. In dependency of the roof orientation, the location in the world and the power consumption an optimal design can be found which is optimal according to a target function e.g. maximum gain, minimum costs or maximum self-sufficiency.

Photovoltaic roof.

Tasks

The following tasks have to be solved:

- Model the photovoltaic problem with different target functions.
- Consider hourly global irradiation data on the basis of the ZIP code.
- Consider batteries to store energy during the day.
- Consider several standard load curves and an increased power consumption in the near future due to electric vehicles or heat pumps.
- Develop a web service which computes an optimal design and delivers the solution via a simple API.
- Accelerate the model using profiling and parallelization.

Contact This project is offered by the *Theory of Hybrid Systems* (i2) research group headed by Prof. Dr. Erika Ábrahám and will be co-supervised by Dr. rer. nat. Pascal Richter. For further questions please contact us via email:

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